

IMPLEMENTING THE *FAO CODE OF CONDUCT FOR RESPONSIBLE FISHERIES*: THE ROLE OF LIBRARIES IN SUPPORTING FISHERIES POLICY AND MANAGEMENT

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ABSTRACT: The *FAO Code of Conduct for Responsible Fisheries* provides a policy framework for sustainable fisheries management. Decision and policy makers as well as resource managers and users all need diverse information to implement the Code in their varied communities. They are challenged to understand the breadth of the information and to access it effectively. These challenges are faced by all but are particularly acute in developing countries. In the spring of 2004, we investigated what information was needed to support implementation of the Code and how it can be accessed by all. To address the former, staff members in the FAO Fisheries Department were surveyed on their information needs, citations in selected Code-related publications were analyzed and key users in developing countries were interviewed. The information landscape in Africa and Southeast Asia was examined to summarize the access challenges. This paper focuses on issues with Code related information in the context of one of the case studies, the Bunda College Library in Malawi. Issues and challenges there are related to broader strategies and opportunities for fisheries libraries to improve the sharing of fisheries and aquaculture information needed to support the implementation of the Code.

KEYWORDS: Responsible fisheries; Code of Conduct for Responsible Fisheries; Malawi; Resource Sharing; Digital Libraries; Institutional Repositories

The Code of Conduct and Information:

The *Code of Conduct for Responsible Fisheries*, formally adopted by the FAO Conference on 31 October 1995, sets forth a voluntary policy framework for sustainable and responsible fisheries and aquaculture worldwide (Doulman 2004).

Fisheries, including aquaculture, provide a vital source of food, employment, recreation, trade and economic well being for people throughout the world, both for present and future generations and should therefore be conducted in a responsible manner. This Code sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity. The Code recognises the nutritional, economic, social, environmental and cultural importance of fisheries, and the interests of all those concerned with the fishery sector. The Code takes into account the biological characteristics of the resources and their environment and the interests of consumers and other users. (FAO, 1995 p.1)

Managing the world's fisheries for sustainability continues to be dynamic, difficult and multi-faceted. The same can be said of tracking implementation of the principles set forth in the Code. Progress on implementation of the Code is carefully monitored by the FAO Fisheries Department (Fisheries Department) which reports to the Committee on Fisheries (COFI). Biennial reports to COFI detail progress, constraints and priorities. COFI uses these reports to plan and direct the Fisheries Department's efforts towards the Code's implementation. In the 2003 *Progress Report on Code Implementation*, FAO Members responding to the biennial questionnaire identified the following constraints when discussing fisheries research and data gathering (FAO COFI 2003, Para. 50):

- Insufficient human, financial and material resources to ensure basic and on-going research programmes;
- Insufficient baseline studies and a general lack of information about species;
- Lack of reliable information and data on indicators;
- Lack of social and economic studies;
- Lack of statistical coverage and difficulties in collecting data;
- Inadequate training;
- Insufficient information about fishing grounds.

More generally, Members reported the "poor levels of scientific research" and "weak institutional capacity (including poor national interagency coordination)" as two of many recurring constraints (FAO COFI 2003, Para. 87). The 2001 Progress Report voiced related concern over the "lack of information and inadequate access to information" (FAO COFI 2001, Para. 47).

Information is critical to successful implementation of responsible fisheries management at local, regional and global levels. Article 12 of the Code addresses fisheries research and makes reference to the importance of information and data. The role of scientific information is generally recognized and can usually be described. However, the essential role of information and particularly access to information is not articulated in the Code.

Supporting implementation of the Code requires a broad information base that includes social, economic, geographic and cultural perspectives as well as the purely scientific. Libraries play an important role in responsible fisheries management as focal points for the collection, management and dissemination of timely and relevant information.

The Project and Its Methodology:

Within this context of the importance of information and the reported concerns from FAO Members about its availability, adequacy and accessibility, the Fisheries Department decided to examine these issues from the perspective of information users, creators and managers. Three major questions served as a framework for the study, namely:

- What are the data and information needed and used for fisheries science and fisheries management?
- What data and information are available for decision-making?
- What opportunities exist for fisheries libraries in all countries to address the constraints of the lack of and the inadequate access to information?

A multi-faceted approach was taken to answering these complex questions. The Fisheries Department staff and selected fisheries experts were surveyed on their use of Code-related information. This provided an important perspective on what information fisheries managers need and actually use. They were asked about what publications they produce and how they are disseminated. Citation studies were done on Code-related information produced by FAO, the academic community and selective governmental, non-governmental and international organizations. While not without their limitations, citation studies provide an indication of the information used by authors when writing publications. Case studies were done to ascertain the availability of fisheries management information in four varied fisheries libraries/documentation centres. The publishing of, the access to and the dissemination of fisheries information in Africa and Southeast Asia were reviewed in broad terms. The November 2003 Regional Workshop on Networking for Improved Access to Fisheries and Aquaculture Information in Africa, provided more insight (FAO 2004c). Trends in information technology were monitored as were the emerging information access strategies of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC).

The Nature of Fisheries Management Information:

Four major features of responsible fisheries information emerged from our studies of users and publications. Each of these features has a significant impact on how libraries collect, manage and disseminate the information.

- Code information is broad and multi-disciplinary.

Perhaps the most obvious feature of responsible fisheries information is its breadth, meaning the variety of disciplines involved, the wealth of languages and the range of voices.

- It has depth in terms of time and perspective.

Developing and implementing environmental management takes time. The process, at its best, is recursive meaning decisions are made and implemented, results evaluated, and changes made in both policy and its implementation. Information to support this process should reflect it; the pool of available information should be deeper than the most recent or the most accessible.

- It involves various scales from very local to global.

Fisheries management information is often locally or regionally focused, yet is also part of a greater context. Using one scale of information without the other can be reckless or just incomplete.

- It covers science with management, a complex interface.

The two sectors have a tense interaction and history in fisheries. However, in terms of information, there is not an either or, but a need to provide access to all.

Responsible fisheries policy and management integrates scientific information with political, economic and social information.

The Case Studies:

The case studies undertaken led us to suggest strategies and opportunities for capitalizing on the nature of fisheries management information to enhance access to it. Four case studies were selected to illustrate the variety of issues as well as to discover common challenges and strategies. The four represent the diversity of fisheries institutions and organizations in developing countries in terms of their size, focus, geographic location, governance and audience. Two African national institutions were selected as representative of the major category of information producing and disseminating organization in the region. The Institut Mauritanien de Recherches Océanographiques et des Pêches is a government oceanographic and fisheries research facility with a regular publications output in a francophone country. The Bunda College of Agriculture is an academic institution with a focus on inland fisheries and aquaculture; it plays a regional educational role and produces a limited number of publications. The other two organizations studied were regional or international, have well-developed online information systems and are representative of some of the developments in Asia. The International Collective in Support of Fishworkers is an international non-governmental organization with an international audience, a focus on artisanal fisheries and fishworkers and extensive digital publications. The Network of Aquaculture Centers in Asia-Pacific is an inter-governmental, regional organization building a digital information system focused on aquaculture.

In this paper, the focus is on Malawi and the Bunda College Library as one example of developing strategies and seizing opportunities to enhance access to information. After background on Malawi and the College Library, the information used and produced by

fisheries managers, researchers and faculty in Malawi is discussed. Then, observations of local issues lead into suggestions of local, regional and international opportunities for collaboration.

Malawi and the Bunda College of Agriculture Library:

Malawi, located in south eastern Africa on the west shore of Lake Malawi, is densely populated (11 million) and poor (per capita GDP of \$160) (US State Department 2004). Life expectancy is 37 years, in part due to the AIDS pandemic. Lake Malawi, the ninth largest lake in the world, is a major resource for the country as fish provide 60-70 per cent of the country's protein supply (Weyl *et al.* 2001). The lake is home to between 500 to 1000 species of fish, many of them endemic to the lake. It also provides a livelihood to 50,000 artisanal fishers and 1,000 commercial fishers.

Bunda College of Agriculture, part of the University of Malawi, was founded in 1967. As of 2002, it has graduated over 3000 students with diplomas, 1700 with BSc, 150 with MSc and 2 PhD. Its mission includes research, teaching and outreach. The College focuses on natural resources, basic studies and agriculture including aquaculture and fisheries (Coche and Collins, 1997).

The Library is housed in a pleasant, spacious facility with adequate wiring for connectivity. The library is open daily and is well staffed. Funding for staff positions is part of the monthly government subvention administered by the College Management. The collection is funded with a variety of grants. Recent ones include \$30,000 from NORAD over two years and another from ICEIDA. The collection has approximately 40,000 books, 10,000 bound periodicals as well as several CD-ROM databases including *Aquatic Biology*, *Aquaculture and Fisheries Resources Abstracts* (ABAFR) and *CABI*. In the past two years, electronic access to full text resources through Access to Global Online Research in Agriculture (AGORA) and Programme for the Enhancement of Research Information (PERI) has expanded the collection immensely. There is, however, a large gap in the journal collection when project funding ceased and before electronic access commenced. Recent funding from ICEIDA through the Aquaculture and Fisheries Department has enhanced the monograph collection in that subject area. Additionally, the faculty of that department has worked with the library to increase the coverage of the locally developed Malawi Fisheries and Aquaculture Database to include all reprints requested by the department. Copies of the documents indexed in the database are either added to the main collection or articles and not-easily-catalogued documents are added to the special collection. There is a special Malawiana collection containing books about Malawi or written by Malawians. Users have easy access to six computers with Internet access at 64 baud. Users pay for access to any non-library uses, such as email, as the Library receives no funding for Internet access. Photocopying is also available at small cost.

The Library is a founding member of the Malawi Library and Information Consortium (MALICO) which was established in May 2003 to bring libraries together to share

expertise, issues and facilitate access to information resources (Ngwira 2003). MALICO provides the vehicle for country-wide negotiations with PERI, BioOne and other providers of electronic resources. The Library also belongs to the IAMSILIC and the Malawi Library Association (MALA). Both of these provide training opportunities and means of sharing expertise.

Digitization has not commenced at the Bunda College Library although staff is well aware of possibilities and the technology. Scanners and adequate computer storage exist within the Library. Staff members have solid knowledge of database management through use of CDS-ISIS. They have begun to evaluate the Greenstone Digital Library software as one tool for developing digital collections. They are reviewing their current thesauri for consistency and coverage. The Library supports the Open Access movement and is learning more about the Open Archives Initiative.

Key Fisheries Information Issues in Malawi:

The following issues are framed using information gathered during a site visit to Bunda College Library and Malawi in June of 2004. The additional perspective was gained from the survey work of Kadzamira, Ngwira and Salanje (2004).

Identifying and collecting local documents

Identifying what fisheries scientists and managers are publishing is central to providing better access. Fisheries scientists and managers in Malawi are active producers of information. The flow is not overwhelming so it should be relatively easy to identify and collect. But it is not. Announcements of publications or institutional publication lists are not currently generated. The various fisheries institutions are geographically very separate as well (Figure 1). There is no coherent distribution system for government or NGO publications in Malawi. Even Bunda College does not have a current, cost-effective information dissemination process. For example, the Aquaculture and Fisheries Department's technical report, *Aqua-Fish*, has been distributed on demand rather than systematically.

Another example of the challenge of identifying and collecting local publications is the case of the proceedings of the 2001 Lake Malawi Fisheries Management Symposium (Weyl *et al.* 2001). This conference was sponsored by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and the Malawi Fisheries Department. Librarians at the Bunda Library had collected several reprints from the conference from the authors at the Monkey Bay Research Station, yet the complete proceedings were elusive. A search of the FAO Fisheries Library collection revealed a copy. The GTZ had sent the publication to FAO but the appropriate library in Malawi did not have it, and none of the local authors had a spare copy to donate to the library. These two examples illustrate the difficulty of knowing what is being published throughout the country as well as procuring those publications.

Maintaining staff capacity and expertise

Bunda College Library supports a broad curriculum and research program and does not have a staff member solely dedicated to fisheries information or any other subject. Consequently, there is no person who consistently seeks out fisheries information as well as related socio-economic and cultural information. Given the expense of information resources such as journal subscriptions and current scientific monographs, funds need to be carefully allocated with knowledge of the subject and the users. The fisheries scientists and managers when asked revealed a broad range of information needs from international regulations and policies to technical manuals for extension work as well as published research on freshwater fisheries (Kadzamira *et al* 2004). Additionally, the technical aspects of local network installation and maintenance of often free CD databases adds a burden to the already over-committed librarians. Having a qualified staff member dedicated to fisheries information becomes something of a luxury.

Rapid changes in library technology have challenged even experienced library staff to cope with constantly learning and applying new techniques and methodologies. Library staff members in Malawi have varying levels of training including diplomas, certification from the MALA and advanced degrees from foreign institutions. Projects such as digitizing local information or unique collections are more difficult in libraries which lack adequately trained support staff to convert the publications systematically.

HIV/AIDS has reduced the numbers of professionals in all sectors in Malawi, especially those in mid career. Consequently, the remaining librarians often have to assume leadership roles without adequate mentoring and take on multiple assignments due to lack of appropriate staff. Younger staff members who may have the ability to become qualified librarians do not have access to the training opportunities available in the 1980s and early 1990s

Sustaining existing electronic networks and access to resources

The dearth of funding and the escalation of the cost of scientific journals decimated library collections in Malawi (and elsewhere) in the 1990s. Bunda College Library had 200 journal subscriptions in the 1980s and now has 31 (Kadzamira *et al.* 2004). Much funding for library collections comes from various donor-funded projects and consequently is directed towards specific subjects and audiences rather than supporting ongoing collection building. Faculty mentioned the problem of obtaining needed information because of gaps in the Bunda collection. Scientists at other research institutions rely heavily on books and reports rather than scientific journals (Kadzamira *et al.* 2004).

Electronic access to full-text journals fills part of this gap and provides access to current issues as well. Some of this access is provided through the FAO AGORA service and some is purchased for a nominal fee through the International Network for the Availability of Scientific Publications (INASP) PERI project. The latter is coordinated through the MALICO. It takes a minimal financial commitment from all participating institutions. However, even this small amount of funds can be difficult for some to find. It

also takes an individual willing to coordinate the consortium's efforts. Sustaining both the financial input and the individual's time and expertise is challenging.

Electronic resources are useless without adequate Internet bandwidth and reliability. The Internet connection at Bunda College has recently improved to a 64 baud radio link. There are currently efforts to establish a VSAT connection to further stabilize connections throughout the country. Again, this takes consistent funding as well as some staff expertise. Both are a struggle to maintain and coordinate.

Assisting fisheries scientists and managers with information

The wealth of new resources available electronically poses a problem for the librarians: how to get users to know they exist and then to use them. The faculty members and students at Bunda College are accustomed to not having direct access and have established other practices, such as requesting current information from authors or learning to make do with older material. Some of the fisheries institutions still lack the necessary equipment to read CDs or access the Internet, although that situation is gradually changing. The new electronic resources can be daunting to users as the interfaces vary, there is overlap between sources, and getting information is often a multi-step process. The library staff members are challenged with changing the information habits of their colleagues and encouraging them to learn unfamiliar tools for finding information.

Local Issues as Opportunities:

The challenge of identifying and collecting local fisheries information becomes an opportunity to increase access to that information, both locally and internationally. Possible strategies include:

- Establishing regular communication among the libraries involved with fisheries in Malawi, including an email list and periodic meetings;
- Inserting Bunda College Library on the Fisheries Department (Malawi Government) and other relevant distribution lists;
- Conducting annual collecting trips to other fisheries institutions and possibly combining these with training workshops;
- Writing project proposals for analyzing the content of the SADC Inland Fisheries collection to ascertain its unique items and its value for adding to an existing fisheries collection or selectively digitizing.

Sustaining access to information involves securing predictable funding for print resources and Internet access. Other strategies not entirely dependent on external funding are also possible and these can enhance the ability to share information and access what others have. These include:

- Promoting the exchange of locally produced bibliographic databases on fisheries via CD;
- Exploring shared cataloguing of local documents;

- Developing additional geographic, taxonomic and vernacular terms for Malawi that compliment and enhance the ASFA thesaurus;
- Proposing mechanisms for improved dissemination and distribution of documents among fisheries institutions within Malawi for consideration by the Department of Fisheries, Bunda College Administration and other institutions;
- Investigating the feasibility of electronic delivery of articles requested through inter-library loan and assess the funding required for implementation;
- Completing the establishment of the VSAT network consortium.

Enhancing the expertise of both library staff and users with fisheries information is a matter of constant training and communication. Long-term strategies are needed in addition to current opportunities, for example:

- Working with MALA to review the MALA training program;
- Advocating for scholarships for library science masters with donors and the Malawi government;
- Sharing training materials on electronic resources among MALICO members and others;
- Targetting audiences for training, such as the Fisheries Faculty at Bunda or extension staff at the research institutions.

Many of these strategies involve networking with colleagues, scientists and managers. From the sharing of expertise through training sessions to the sharing of information resources, networking is a major opportunity for enhancing access to and use of responsible fisheries information. The adoption and use of standard methodologies are also critical to better access. This can be as broad as improving internet access through awareness of changing technology to as detailed as standardizing database record format so sharing is possible.

Both networking and the promotion of standard methodologies make possible the creation of local digital collections. In Malawi, the potential of networking prompted Ms. Kadzamira to attend the training session in Botswana titled "Managing Digital Libraries", sponsored by the International Federation of Library Associations (IFLA). Her new expertise adds to the network of skills both locally and regionally. Awareness of possible formats and approaches to digitization and the subsequent organization of materials are critical to building usable digital collections. Staff at Bunda Library use IAMSLIC, INASP and other networks to stay current with discussions on guidelines, issues (such as Open Access) and opportunities.

The Challenge to Collaborate:

The opportunities and challenges identified for Malawi and the Bunda Library reflect the needs in general of those using responsible fisheries information anywhere in the world. In other words, they are not only local opportunities and challenges but they apply also in the national, regional and international arenas. Cooperation between libraries for better access to information facilitates improves decision- and policy-making at all levels.

The specific issues and challenges referred to in the case of Bunda College Library are common to most fisheries libraries to a greater or lesser extent. The characteristics of fisheries information in terms of its breadth, depth, scale and interdisciplinarity make inter-library co-operation essential, especially in situations of limited human and financial resources. Consequently, partnerships and networking are important, if not essential, so that information resources and expertise can be shared.

- **Local and National level**

Information on the fisheries in a specific locality or a specific country is normally the most important resource for the sector as a whole in that country. Many of the participants at the Grahamstown regional workshop (FAO 2004c) emphasised the importance of their specialized collections on national fisheries, including Bunda cited above and the National Institute for Freshwater Fisheries Research, Nigeria. (Ibeun 2004). Organizing, managing and disseminating this information is one of the most important functions of the libraries of national institutions concerned with fisheries. Ensuring that this information is accessible by all at the level where livelihoods are concerned and fisheries management is implemented is a major challenge. The maintenance of local collections and their dissemination to all stakeholders via bibliographic databases, and in the future digitally, is more effective where libraries collaborate at the national level. This ensures that locally generated information is used and consequently validated. Fisheries libraries also need to provide a wide range of information across many disciplines. Inadequate budgets and institutional missions often preclude a multidisciplinary collection. Inter-library cooperation at the national level is therefore essential to provide access to the breadth of fisheries-related information, including environmental and general science, socio-economics, legislation and information on national markets and trade. Libraries can help bring science and management together by providing access to the breadth of information and by training users to find information outside their often narrow disciplines. Recognition of and compatibility with national information systems and standards are essential. This is particularly true where human and financial resources are limited and the country cannot yet support technological diversity. Compatibility applies to metadata standards and library software as well as digitization standards.

- **Regional level**

In addition to the importance of fisheries at the national level, is the fact that fisheries resources and their management are often regional in nature. One only has to look at the examples of the African Great Lakes, the Mekong River, the Eastern North Pacific, the Gulf of Mexico, and the Mediterranean Sea to realize that without regional cooperation and the sharing of information there is little hope of the responsible management and development of fisheries. The many regional fisheries organizations, in addition to the regional fishery management bodies, are evidence of the importance of the 'regionality' of fisheries. These same organizations and bodies also offer opportunities for sharing information resources. Notwithstanding this, it is important that the experience, the lessons learned and the research results of national

institutions are shared between countries in the region in order to strengthen this regional collaboration. Providing access to the necessary breadth and depth of specifically fisheries information is only possible if libraries cooperate at regional level. Some of the issues and areas where fisheries libraries are co-operating at the regional level in Africa were covered at the Grahamstown regional workshop (FAO 2004c).

- **International level**

Last but not least are the international aspects of fisheries, including not only the fisheries resources themselves, but fisheries agreements, legislation, management bodies, trade, and the very ecosystems of which the resources are a part.. To enable us to have access to and share the relevant information resources internationally, the very broad 'aquatic community' has to develop common standards for the systems and tools necessary for their management. There is much activity in the development of fisheries information systems and tools at international level. The following are three examples of international collaboration programmes relevant to fisheries libraries and to the improved access to information in support of the Code of Conduct for Responsible Fisheries:

- **FAO.** The FAO Code of Conduct for Responsible Fisheries provides a framework for collaboration among fisheries libraries. The ASFA partnership enhances access to local fisheries information through incorporation into this major bibliographic database (FAO 2004b). The ASFA project makes the database freely available to national institutions in Low Income Food Deficit Countries and there are currently 49 recipients, mainly in Africa. Access to AGORA is an FAO coordinated project that provides libraries in the poorest countries with free access to over 500 full text journals, including major fisheries journals (FAO 2004a). Currently 295 institutions in 51 countries are registered with AGORA.
- **UNESCO.** One of the two major concentrations of UNESCO's communication and information programme is "fostering equitable access to information and knowledge for development" (UNESCO 2003). Part of this focus concerns greater participation in global information networks with an action being to increase the capacity of libraries. As an active supporter of open source software, UNESCO continues to develop, disseminate and promote information management tools, including the Greenstone Digital Library software and the CDS/ISIS bibliographic software, including the recently released Integrated Library system WEBLIS. It also recently contracted with IFLA and the International Council on Archives to produce comprehensive guidelines to digitizing collections (IFLA *et al.* 2002).
- **IAMSLIC.** Our professional association provides a forum to discuss and encourage participation in the use of technology to enhance access to fisheries

information. IAMSLIC is posed to build on the discussion and utilize its members' expertise and enthusiasm to provide more ways for fisheries libraries to collaborate. Suggested next steps include:

- Expand coverage of the Distributed Library so all member institutions have loaded their unique records into the system.
- Promote building institutional repositories and regional repositories.
- Implement a harvester for existing appropriate institutional repositories.
- Adopt basic digital library guidelines so members have a baseline to use when initiating projects.
- Continue to support local initiatives with small grants such as the training grant given to Bunda Library.

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Figure 1: Fisheries Institutions and Projects in Malawi

